

Westford Stream Team 2013 Results and 2013 Special Study

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Monitoring Result Summary

- **High Nitrate** levels in **Reed, Butter, Gilson**, Vine, Nashoba (after Vine)
 - Recommend extra sampling on Reed, Butter
- **High Ammonia** in Gilson in August
- **High Total Phosphorous** in Nashoba and Vine
 - See 2013 Special Study
- **Low Dissolved Oxygen** in Keyes in summer
 - Recommend 24-hr study to determine diurnal duration
- **Highest Conductivity** in Nashoba @ Powers
 - Recommend sampling upstream at multiple locations
- **Low pH (<6.5)** in Reed, sometimes in Butter, Keyes

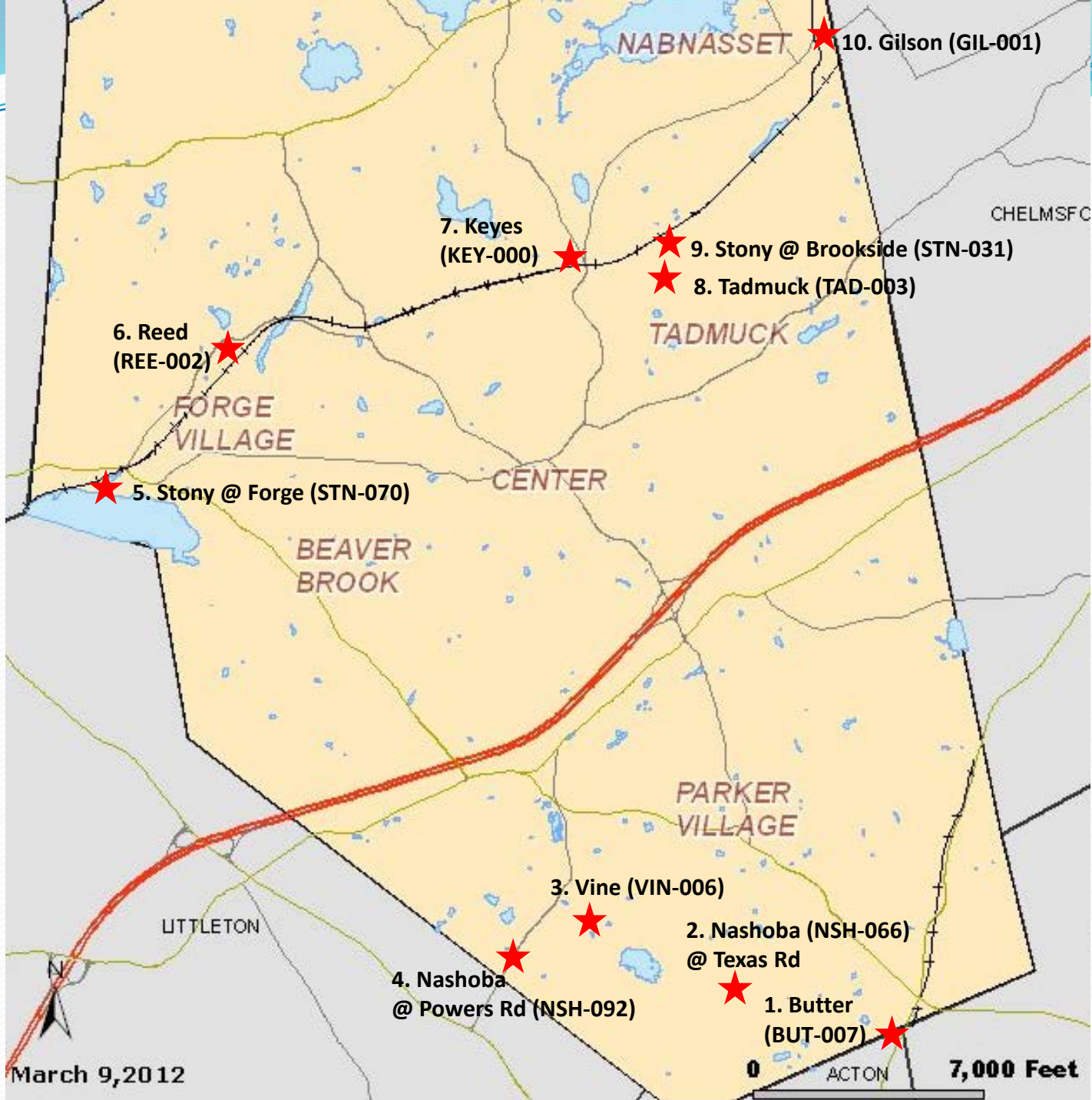
Vine Brook Special Study Summary

- **Total Phosphorous Spike** at Rt 110 (0.39 mg/l)
 - Low level upstream at Rt 495 (0.02 mg/l)
 - Diluted downstream (0.08 mg/l)
 - Recommend sharing results with BoH, Engineering
 - Outdoor debris storage?
 - Wastewater effluent?
- **Very Low pH** at tributary stream
 - Consulted with USGS, DCR, Nashua River Watershed, others
 - Recommendations were add'l sampling to check if natural
 - Sampling on MA Audubon section (away from Liberty Way)
 - Sampling into September (Natural low pH usually in Winter/Spring)

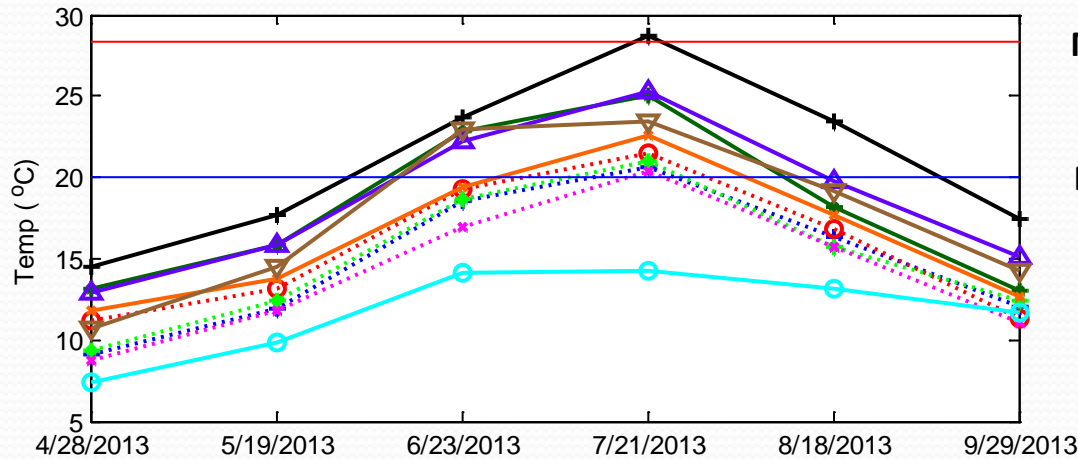
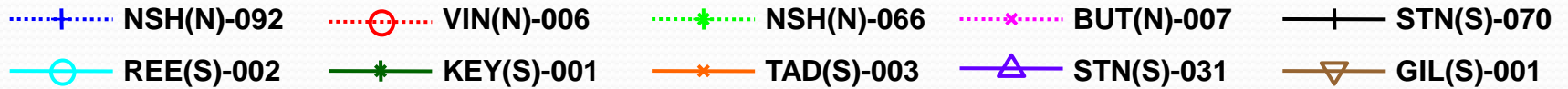
Overview

➤ 2013 Monitoring Summary

- Sampled 10 stream sites in Westford
- Coordinated activities with OARS
 - Used YSI meters purchased by Town in 2012
 - QC'd meters before/after sampling
 - 6 sampling dates: April, May, June, July, August, September
- Temp, pH, dissolved O₂, conductivity, and river observations for all sites April - September
- Sampled N, P, TSS for 6 sites on all dates
 - Nashoba (2 sites), Vine, Stony (2 sites), Gilson
 - Other sites sampled April, June, Aug
 - Bottle samples analyzed by Nashoba Analytical Laboratory
- 2013 Vine Brook special study



Temperature and DO Results

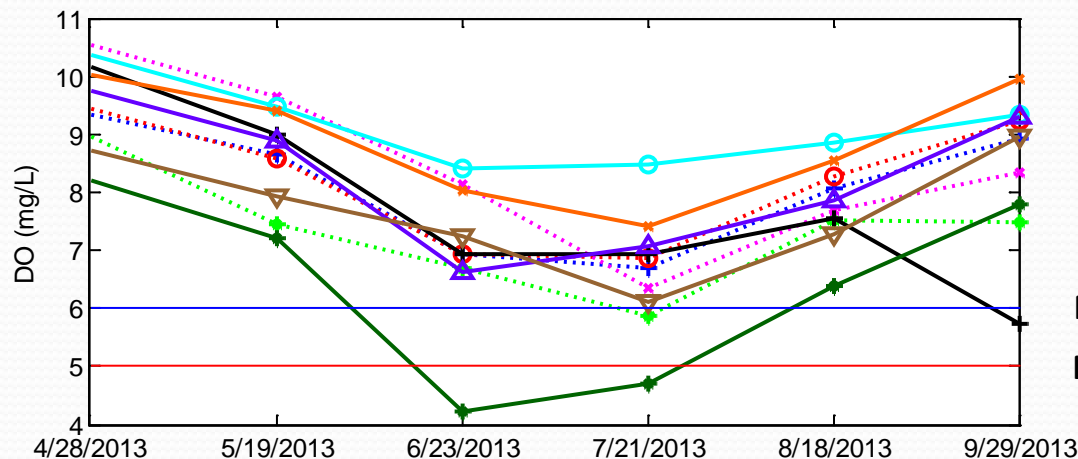


MA warm-water fisheries

MA cold-water fisheries

Reed could support cold-water fish

Other streams could support warm-water fish

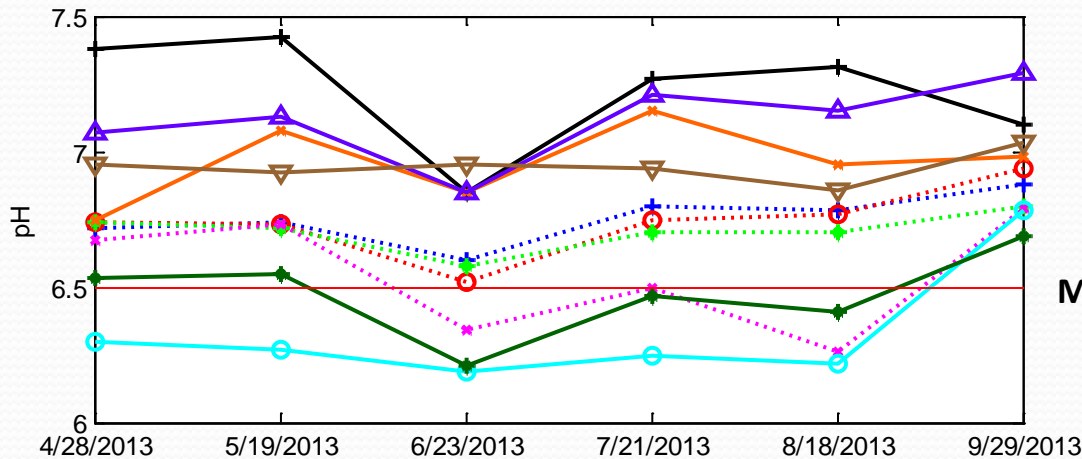
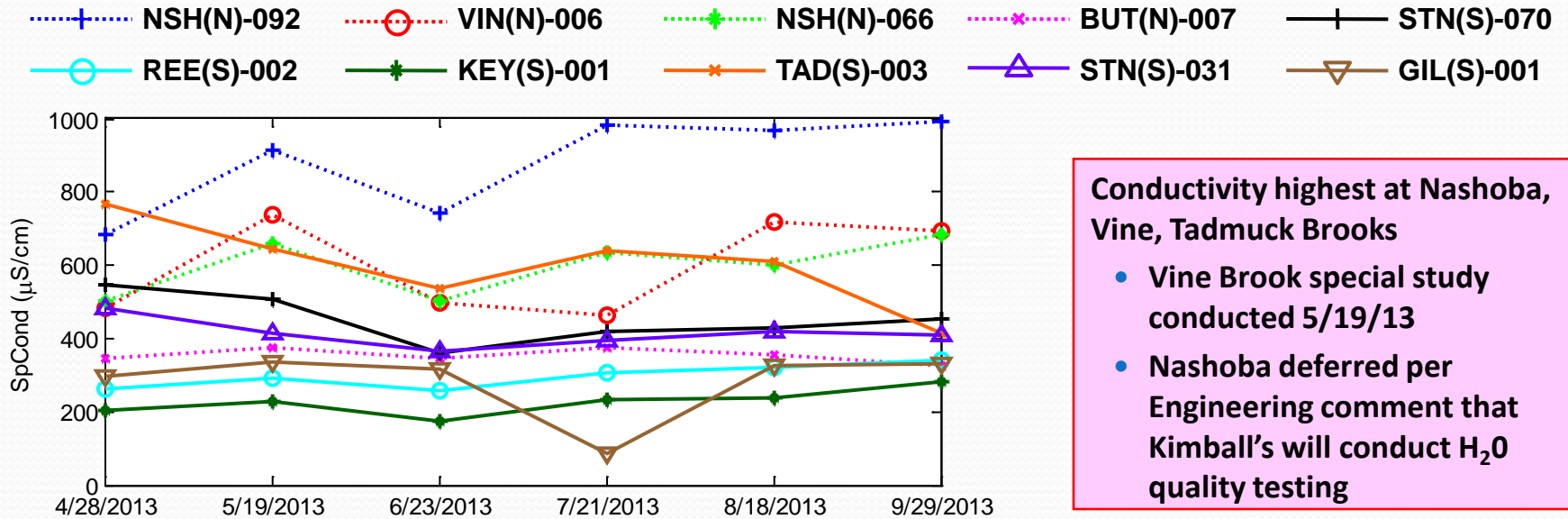


Low DO in Keys
Recommend 24-hr meter collections to see if >8 hr/day

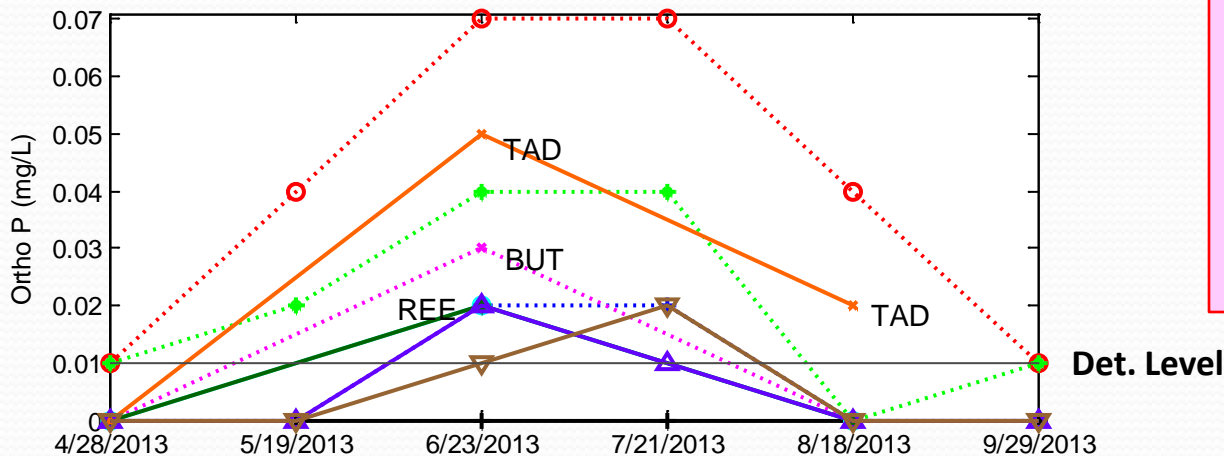
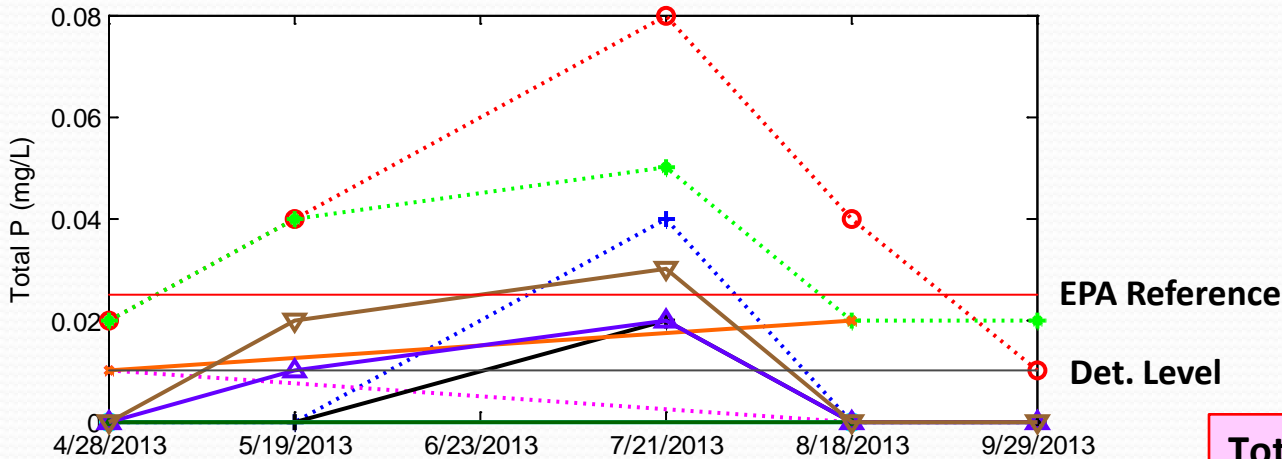
MA cold-water fisheries

MA warm-water fisheries

Conductivity and pH Results

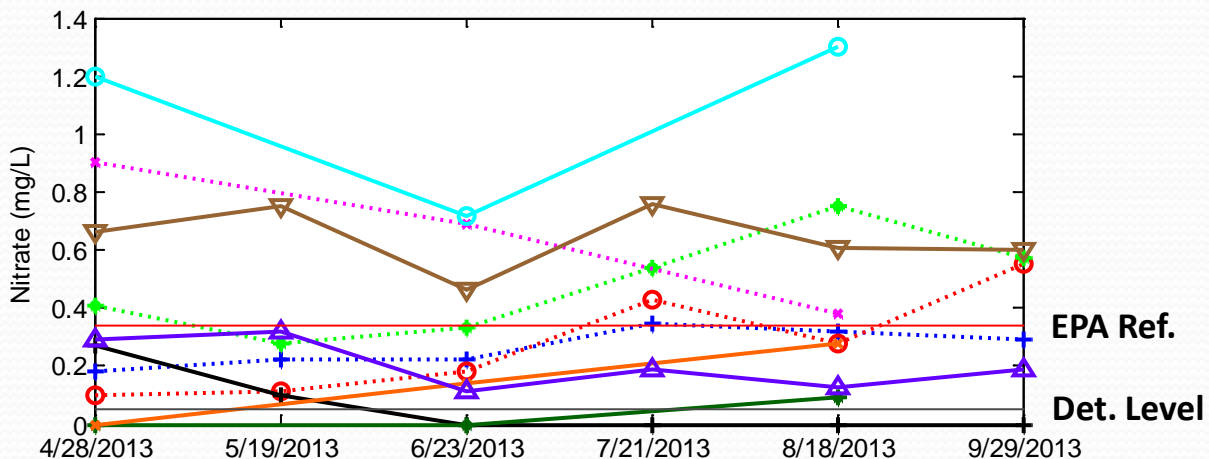
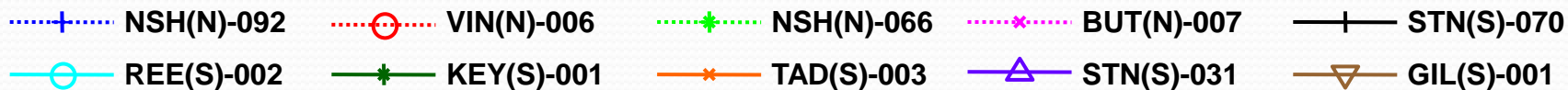


Total & Ortho Phosphorous Results



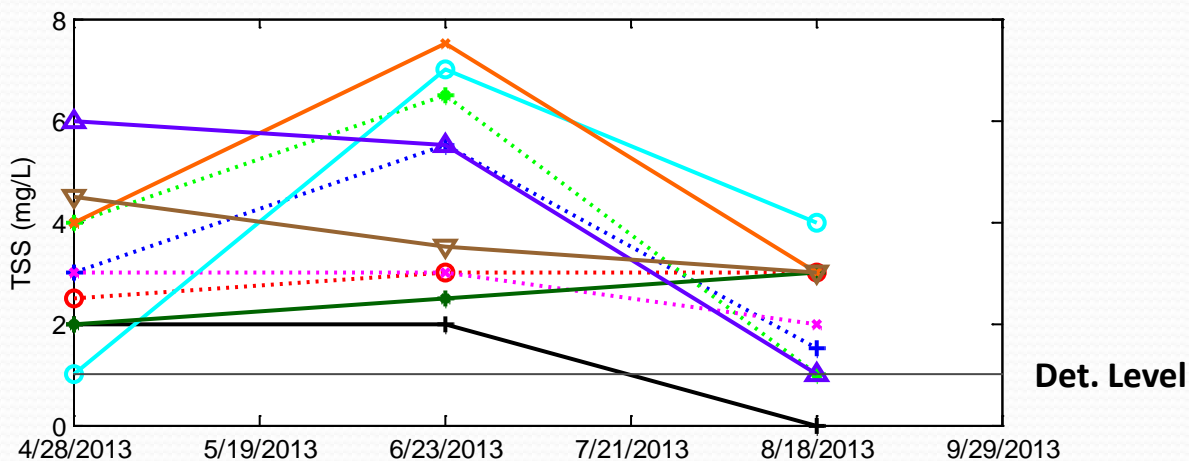
Total P high in Vine Brook
 – Special study 5/19/13
 Source of high P in Nashoba unknown
 High P in Gilson (7/21) likely due to fertilizer use. (Noted milky sheen in water)

Nitrate and TSS Results



Nitrate concentrations generally good. High values in Reed, Butter, Gilson (same as '11, '12)

- Recommend further investigation for Reed Brook (2015?)
- 2011 special study for Gilson -> N comes from Blue Brook/Nabnasset

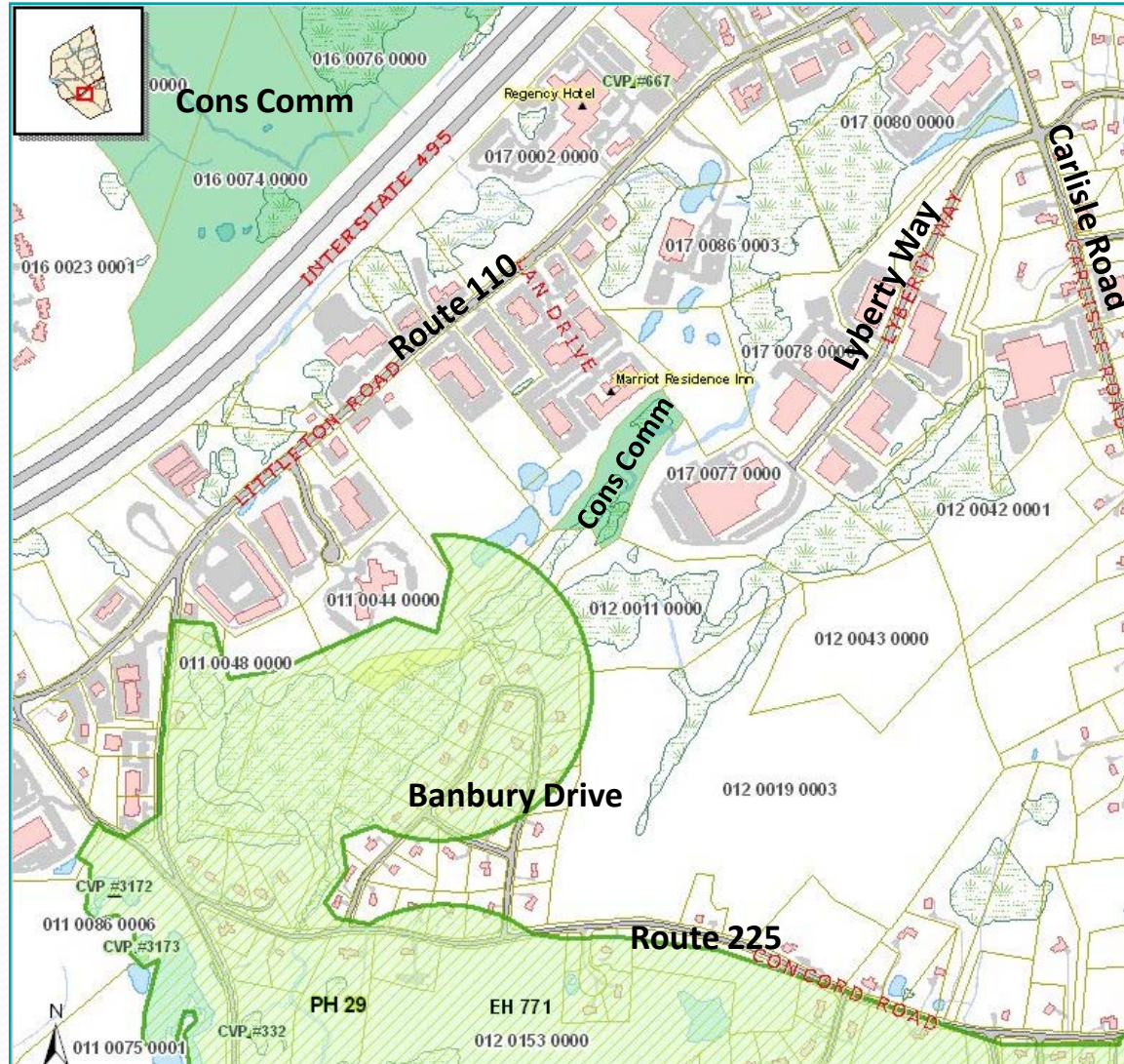


TSS consistently low
No value to continue monitoring except after storm events

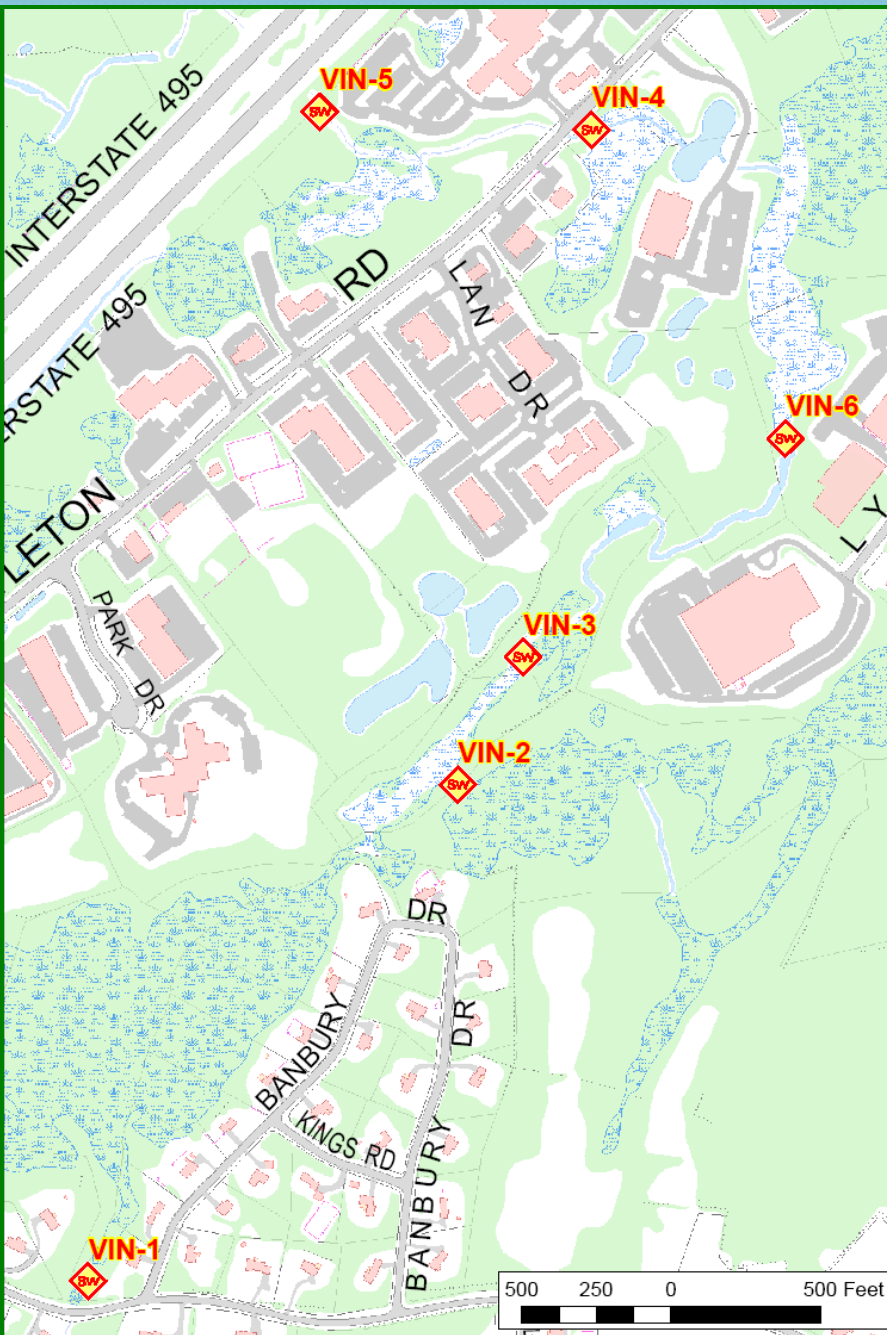
Overview

- 2013 Monitoring Summary
- **2013 Vine Brook special study**
 - 5/19: Sampled 6 upstream sites between Rt 495 and Concord Rd (Rt 225)
 - Total & ortho phosphorous
 - Conductivity, pH, oxygen
 - Nitrates (3 sites)
 - Additional sampling along tributary 5/31 and 6/23
 - Purpose: map pH further upstream
 - Where possible, also measured conductivity, dissolved oxygen

Area Overview

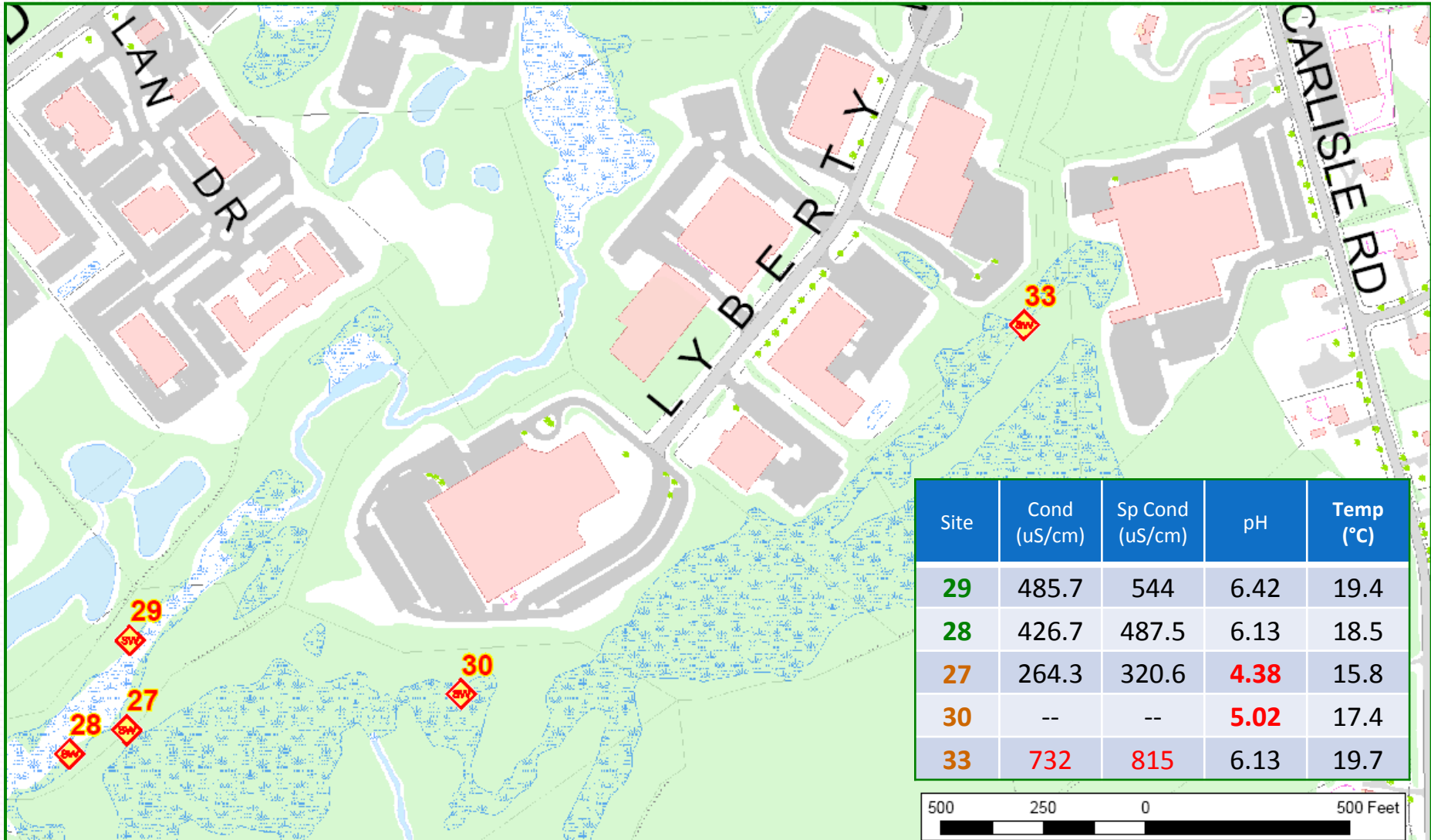


Vine Brook Study: 19 May 2013



	VIN-1	VIN-2	VIN-3	VIN-6	VIN-4	VIN-5
P - Ortho (mg/L)	0.07	ND	0.05	0.07	0.15	0.02
P - Total (mg/L)	0.09	ND	0.06	0.08	0.39	0.02
Nitrate (mg/L)	0.27	--	--	ND	--	0.05
Cond (uS/cm)	674	178.4	631	704	507	307.2
Sp Cond (uS/cm)	826	227.6	769	765	605	374
DO (mg/L)	2.54	5.2	9.08	9.77	9.61	8.59
DO (%)	25.5	50.3	91.4	109.3	98.6	86.3
pH	6.25	4.5	6.58	6.57	6.71	6.65
Temp (°C)	15.4	13.7	15.6	20.8	16.5	15.6

Tributary Sampling: 31 May 2013



Tributary Sampling: 23 June 2013

Site	Cond (uS/cm)	Sp Cond (uS/cm)	DO (mg/L)	DO (%)	pH	Temp (°C)
37	577	631	6.66	74.1	6.33	20.5
36	502	555	6.76	75.5	6.18	20.1
35	212.6	250.0	3.81	39.6	4.66	17.2
38	--	--	3.81	40.7	4.69	17.9
40	--	--	2.40	26.6	5.52	19.4

